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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,741	04/26/2006	Johannus Theodorus Matheus Hubertus Dielissen	NL03 1295 US1	2854

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PO BOX 3001
BRIARCLIFF MANOR, NY 10510-8001

EXAMINER	
CHAU, PETER P	

ART UNIT	PAPER NUMBER
4144	

MAIL DATE	DELIVERY MODE
08/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,741	DIELISSEN ET AL.	
	Examiner	Art Unit	
	PETER CHAU	4144	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/26/2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/26/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-6 have been examined and are pending.

Information Disclosure Statement

2. An initialed and dated copy of Applicant's IDS form 1449 submitted on 10/20/2004, is attached to the Office Action.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/IP04/52115, filed on 10/20/2004.

5. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

6. Figure 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities: On page 6, first paragraph, the beginning of the sentence "f multiple..." should be read as "If multiple...". Appropriate correction is required.

8. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: on page 6 line 6, "switch 102" should be read as "switch 120" 102 as an input port. Numerous errors occur with that specific error.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 1-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by "Trade-offs in the design of a router with both guaranteed and best-effort services for networks on chip." Rijpkema et. al. (herein after "Rijpkema") (IDS filed on 4/26/2006).

11. As per claim 1, Rijpkema teaches an integrated circuit comprising a network, the network comprising a plurality of routers, at least one of the routers comprising a plurality of input ports arranged to receive input data corresponding to at least two traffic classes, the routers further comprising a plurality of queues, the queues being arranged to store input data corresponding to a single traffic class, wherein the input ports are coupled to at least two of the queues, the routers further comprising a switch characterized in that the switch is arranged to receive input from the plurality of queues simultaneously (fig. 3 shows a network comprising a plurality of routers; fig. 8, shown is a plurality of input ports receiving data, the BQs (Best effort data queues) and GQs (guaranteed data queues) define traffic classes coupled to an input port and those plurality of queues are connected to a multiplexer (i.e. a type of switch) to transmit data from the queues to the multiplexer; page 295 right column line 28-30, guaranteed services would be used for critical traffic (i.e. high priority traffic class) and best-effort services used for non-critical traffic (i.e. low priority traffic class)).

12. As per claim 2, Rijpkema teaches an integrated circuit as claimed in claim 1, wherein a first selection of the queues is arranged to store input data corresponding to a high priority traffic class, and wherein a second selection of the queues is arranged to store input data corresponding to a low priority traffic class (fig. 8 shows the input port selecting data to be queued into two classes, BQ (Best effort data queue) and GQ

(guaranteed data queue); page 295 right column line 28-30, guaranteed services would be used for critical traffic (i.e. high priority traffic class) and best-effort services used for non-critical traffic (i.e. low priority traffic class)).

13. As per claim 3, Rijpkema teaches an integrated circuit as claimed in claim 2, wherein the first selection is deployed to provide guaranteed communication services in the network, and wherein the second selection is deployed to provide best-effort communication services in the network (fig. 8 shows the input port selecting data to be queued into two classes, BQ (Best effort data queue) and GQ (guaranteed data queue); page 295 right column line 28-30, guaranteed services would be used for critical traffic (i.e. high priority traffic class) and best-effort services used for non-critical traffic (i.e. low priority traffic class)).

14. As per claim 6, Rijpkema teaches a method for avoiding starvation of data in an integrated circuit comprising a network, the network comprising a plurality of routers, at least one of the routers comprising a plurality of input ports receiving input data corresponding to at least two traffic classes, the routers further comprising a plurality of queues, wherein the queues store input data corresponding to a single traffic class, the input ports being coupled to at least two of the queues, the routers further comprising a switch, characterized in that the switch receives input from the plurality of queues simultaneously (fig. 3 shows a network comprising a plurality of routers; fig. 8, shown is a plurality of input ports receiving data, the BQs (Best effort data queues) and GQs (guaranteed data queues) define traffic classes coupled to an input port and those plurality of queues are connected to a multiplexer (i.e. a type of switch) to transmit data

from the queues to the multiplexer; page 295 right column line 28-30, guaranteed services would be used for critical traffic (i.e. high priority traffic class) and best-effort services used for non-critical traffic (i.e. low priority traffic class)).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

18. Claim 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rijpkema as applied to claim 1 above, and further in view of below.

As per claim 4, Rijpkema teaches an integrated circuit as claimed in claim 1. Rijpkema does not teach further comprising a controller which is coupled to the input ports and coupled to the switch, the controller comprising a plurality of arbiters, wherein the arbiters of at least one of the traffic classes implement a predetermined schedule. While Rijpkema teaches a matrix scheduling (i.e. an arbiter unit that schedules the traffic queues for the corresponding output) that computes which inputs and outputs must be connected in a switch (page 298 line 21-23) and input ports (i.e. a selecting arbiter unit) selecting data to be queued into two classes (fig. 8), Rijpkema does not teach having a controller comprising a plurality of arbiters connected to the inputs and the switch.

However, it is known to one of ordinary skill in the art at the time of the invention that NoC (Network on a chip) are emerging as an alternative to existing on-chip interconnects because they are scalable (i.e. reduced size) when compared to traditional buses (Rijpkema line 12-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine plurality of arbiters (i.e. an arbiter unit that schedules the traffic queues for the corresponding output and selecting arbiter) into the controller coupled to the input ports and switch to reduce the size of the NoC.

19. As per claim 5, Rijpkema teaches an integrated circuit as claimed in claim 1. While Rijpkema teaches multiplexers being coupled to plurality of queues and each one of the multiplexers being arranged to accept as input the input data stored in the queues (fig. 8, where the multiplexers are coupled to the queues to receive input data), Rijpkema does not teach the switch comprises a plurality of multiplexers, each multiplexer being coupled to an output port.

However, it is known to one of ordinary skill in the art at the time of the invention that NoC (Network on a chip) are emerging as an alternative to existing on-chip interconnects because they are scalable (i.e. reduced size) when compared to traditional buses (Rijpkema line 12-20).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine plurality of multiplexers into the switch coupled to an output port to reduce the size of the NoC.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

WO 2004/057808 Rijpkema

US Patent 6,680,933 Cheesman et al.

US Patent 6,618,378 Giroux et al.

US Patent 6,215,767 Li, Chia-Chang

US PGPub 2003/0128712 Moriwaki et al.

US PGPub 2002/0136230 Dell et al.

US PGPub 2001/0033581 Kawarai et al.

US PGPub 2001/0007562 Matsuoka et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER CHAU whose telephone number is (571)270-7152. The examiner can normally be reached on Monday-Friday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Taghi Arani can be reached on 571-242-3787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. C./
Examiner, Art Unit 4144

/Taghi T. Arani/
Supervisory Patent Examiner, Art Unit 4144
8/12/2008